

SikaCem®-133CP Gunite

R4 Low Resistivity Dry Sprayed Repair Concrete

Product Description	SikaCem® -133CP Gunite (formerly Sikacrete® CP) is cement based one component repair mortar containing limestone aggregate and meeting the requirements of Class R4 of BS EN 1504-3. Formulated for machine applications using the dry process without set accelerators. Repairs and overlay may be profiled and trowel finished where necessary.
Uses	<ul style="list-style-type: none">■ Large volume repairs■ Bridges■ Marine structures■ Tunnels■ Conductive overlay for anode and mesh cathodic protection applications■ For exterior and interior use■ In place of R1, R2 & R3 mortars
Characteristics / Advantages	<ul style="list-style-type: none">■ One component, ready to use micro concrete■ Non silica aggregates■ Low rebound losses and dust formation during the spraying process■ Rapid strength gain without caustic set accelerators■ Can be finished to a high standard■ Overcoatable with Sika reprofiling / levelling mortars and coatings
Tests	
Approval / Standards	Conforms to the requirements of BS EN 1504-3 R4 Classification Complies with Highways Agency Specification for Highways works Series 1702 & 1704 and Materials for The Repair of Concrete Highway Structures (BD 27/86) Model Specification for Sprayed Concrete.
Product Data	
Form	
Appearance /Colours	Grey powder
Packaging	25 kg bag
Storage	
Storage Conditions/ Shelf-Life	6 months from date of production if stored properly in original unopened, sealed and undamaged packaging in dry and cool conditions.

Construction



Technical Data

Chemical Base	Portland cement, selected aggregates and additives.	
Density	Fresh mortar density: ~ 2.25 kg/l	
Grading	D _{max} : 3.0 mm Limestone aggregate	
Layer Thickness	10 mm min. / 100 mm max on vertical surfaces < 50mm overhead	
Thermal Expansion	Coefficient $11 \times 10^{-6} / ^\circ\text{C}$	
Resistivity K Ω.cm	~ 10	Saturated Lime water at 28 days 100 x 200 mm cylinders
Cement content	> 480 – 525 Kg/m ³	
Chloride Content Class	Cl 0,10	Series 1704 part 4

Mechanical / Physical Properties

Compressive Strength	1 day ~ 20 N/mm ² 28 days ~ 50 N/mm ²	(EN 12190)
Flexural Tensile Strength	28 days~ 9.0 N/mm ²	(EN 12190)
Rebound	~ 10% on vertical surfaces	

CE Requirements

Requirements as per BS EN 1504-3 Class R4

	Results	Requirements (R4)
Compressive Strength	Pass	> 45 N/mm ² (MPa)
Chloride Ion Content	Pass	< 0.05%
Adhesive Bond	Pass	$\geq 2.0 \text{ N/mm}^2$ (MPa)
Carbonation Resistance	Not tested	Lower than control
Elastic Modulus	Pass	$\geq 20 \text{ kN/mm}^2$ (GPa)
Capillary Absorption	Pass	$< 0.5 \text{ kg.m}^{-2}.\text{h}^{-0.5}$

Application Details

Consumption	This depends on the substrate roughness and thickness of layer applied. As a guide, ~ 2.2 kg/m ² /mm.
Substrate Quality	<p><i>Concrete</i></p> <p>The concrete shall be free from dust, loose material, surface contamination and materials which reduce bond or prevent suction or wetting by repair materials.</p> <p><i>Steel reinforcement</i></p> <p>Rust, scale, mortar, concrete, dust and other loose and deleterious material which reduces bond or contributes to corrosion shall be removed to a minimum standard of SA2½.</p> <p>Reference should also be made to BS EN1504-10:2003 for specific requirements.</p>
Substrate Preparation / Bonding Primer/ Reinforcement Coating	<p><i>Concrete:</i></p> <p>Delaminated, weak, damaged and deteriorated concrete and where necessary sound concrete shall be removed by suitable mechanical or very high pressure water blasting [up to 110 mPa (16500 psi)] techniques.</p> <p>Tying wire fragments, nails and other metal debris embedded in the concrete should be removed where possible.</p> <p>The edges where concrete is removed should be cut at a minimum angle of 90° to avoid undercutting and a maximum angle of 135° to reduce the possibility of debonding with the top surface of the adjacent sound concrete and should be roughened sufficiently to provide a mechanical key between the original material and SikaCem® -133CP Gunitite repair mortar.</p> <p>Ensure sufficient concrete is removed from around reinforcement to allow coating and compaction of the repair material.</p> <p><i>Steel reinforcement:</i></p> <p>Surfaces should be prepared using abrasive blast cleaning techniques or high pressure water blasting [up to 60 mPa (9000 psi)] techniques.</p> <p>Where exposed reinforcement is contaminated with chloride or other material which may cause corrosion, the reinforcement shall be cleaned by low pressure water blasting [up to 18 mPa (2700 psi)].</p> <p><i>Reinforcement corrosion protection coating:</i></p> <p>Where a coating is required as a barrier, apply to the whole exposed circumference two coats of SikaTop® Armatec-110 EpoCem®. (Refer to the relevant Product Data Sheet).</p> <p>Reference should also be made to BS EN1504-10:2003 for specific requirements.</p> <p>Overlays</p> <p>Where a cathodic protection mesh is used and overlay is <50mm thickness no further mesh reinforcement should be necessary.</p> <p>Where a protective overlay is required without a cathodic protection mesh SikaCem® 133 Gunitite repair mortar is recommended.</p>

**Application
Conditions /
Limitations**

Substrate Temperature +3°C min. / +30°C max.

Air Temperature +3°C min. / +30°C max.

**Application
Instructions**

**Mixing / Application
Method / Tools**

SikaCem[®] -133CP Gunitite is fed into the dry process spraying machine. The amount of water added is controlled by the nozzleman and should be sufficient to prevent slump and dust. Rebound will be increased with a dry mixture and thin layers.

The repair mortar shall be placed onto the pre-wetted substrate between the minimum and maximum layer thicknesses without the formation of voids and loose rebound material. Where layers are to be built up to prevent sagging or slumping, each layer should be allowed to stiffen before applying subsequent layers "wet on wet". When layers cannot be applied "wet on wet", pre-wet surface and allow to surface dry to a dark matt appearance.

SikaCem[®] -133CP Gunitite is finished by leaving 'as shot' or striking off with a straight edge and closing the surface with a wooden/plastic float or damp sponge to achieve the desired surface texture.

Reference shall be made to BS EN1504-10:2003 for specific requirements, the Code of Practice for sprayed concrete issued by the Concrete Society and any other guidelines that are specific to the structure.

Cleaning of Tools

Clean all tools and application equipment with water immediately after use. Hardened/cured material can only be mechanically removed.

**Notes on Application /
Limitations**

Refer to recommendations provided in BS EN 1504-10.

Avoid application in direct sun and/or strong wind and/or rain.

Do not add water over recommended dosage.

Apply only to sound, prepared substrates.

Do not add additional water during the surface finishing as this will cause discoloration and cracking.

Protect freshly applied material from freezing.

Do not over work final finish as this can cause surface cracking

Rebound, slump and overhead layer thickness will be affected by the w/c ratio, type of spraying equipment, presence of reinforcement and air pressure used to convey material to the nozzle. A balance should be achieved to optimise material usage by adjusting water and air pressure and number of passes to achieve thickness build up relevant to the repair size.

Curing Details

Curing Treatment

It is essential to cure the repair mortar immediately after application for a minimum of 3 days to ensure full cement hydration and to minimise cracking. Use polythene sheeting taped down at the edges or other approved method.

Curing compounds shall not be used when they adversely affect subsequently applied products and systems.

Reference shall also be made to BS EN1504-10:2003 for specific requirements.

Value Base All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

Local Restrictions Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

Health and Safety Information For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Material Safety Data Sheet containing physical, ecological, toxicological and other safety-related data.

Legal Notes The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

CE Labelling

The harmonised European standard EN 1504-3 “Products and systems for the protection and repair of concrete structures – Definitions, requirements, quality control and evaluation of conformity – Part 3 Structural and non-structural repair” specifies the identification, performance (including durability) and safety of products and systems to be used to repair concrete surfaces (either building or civil engineering structures).

Non-structural repair fall under this specification – they need to be CE-labelled as per Annex ZA.2, table ZA.2 conformity 2+ and fulfil the requirements of the given mandate of the EU Construction Products Directive (89/106/CE).

 0086	
Sika Ltd, Welwyn Garden City, Herts AL7 1BQ, UK 14 0086 CPD - 541325 BS EN 1504 -3 Concrete Repair Product for Structural Repair PCC Mortar (based on hydraulic cement)	
Product	SikaCem[®] - 133CP Gunitite
Compressive Strength	Class R4
Chloride ion Content	≤ 0.05%
Adhesive Bond	≥ 2.0 MPa
Carbonation Resistance	Not tested
Elastic Modulus	≥ 20 GPa
Capillary Absorption	< 0.5 kg.m².h^{0.5}
Dangerous Substances	Complies with 5.4
Reaction to Fire	Class A1

* Should only be used in Non Fire Regulated Structures



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